2nd Semester BIT May - 2011

Mathematics (BIT-202) Max. Marks: 80

Time Allowed: 2 ½ hrs Min Pass Marks: 32

NOTE:- Attempt all questions from Section A & B and only two questions from Section C.

Section A: Very short answer type questions

Q1: i) Define a power set & find power set of $\{1,2,3\}$

ii) Find $f(2)$ if $f(n) = (n^2-1)/n+4$.

(iii) Find $\lim_{n \to 2} \frac{n^3-4}{n-2}$

(iv) Find the derivative of n^2+n-1

v) Show that function $f(n) = 3n+1$ is one-one.

vi) Find the value of $\int (n^3+1)\,dn$

vii) Integrate $(1/n + \sin n)$

viii) Factorize the following using Boolean algebra $Pn+q$.

Section B: Short answer type questions

Q2: If

$A = \{1,2,3,4,7,8\}$

$B = \{4,5,7,9,10\}$

Find $A \cup B$, $A \cap B$ & verify

$(A \cup B)' = A' \cap B'$.

Q3: Evaluate: $\lim_{n \to 0} \frac{(1+n)^n - 1}{n}$

Q4: Find the derivative $\sin^{-1} n$ by first principle

Q5. Prove that using Boolean algebra,

a) $a + a \cdot b = a$ b) $a + a' \cdot b = a + b$.

Section C: Long answer type questions;

Q6: a) If $A = \{1,2,3\}$, $B = \{2,4\}$, $C = \{2,5\}$,

Find $A \times (B \cap C)$, $A \times (B \cup C)$, $(A \times B) \cap (B \times C)$

b) If $f(n) = \log\left[\frac{1-n}{1+n}\right]$ Show that $f\left[\frac{2n}{1+n^2}\right] = 2f(n)$.